

SEQUENCE LISTING

(1) GENERAL INFORMATION:

(i) APPLICANT: Jay A. Fishman

(ii) TITLE OF INVENTION: MOLECULAR SEQUENCE OF SWINE RETROVIRUS
AND METHODS OF USE

(iii) NUMBER OF SEQUENCES: 74

(iv) CORRESPONDENCE ADDRESS:

(A) ADDRESSEE: LAHIVE & COCKFIELD, LLP
(B) STREET: 60 State Street
(C) CITY: Boston
(D) STATE: Massachusetts
(E) COUNTRY: USA
(F) ZIP: 02109-1875

(v) COMPUTER READABLE FORM:

(A) MEDIUM TYPE: Floppy disk
(B) COMPUTER: IBM PC compatible
(C) OPERATING SYSTEM: PC-DOS/MS-DOS
(D) SOFTWARE: PatentIn Release #1.0, Version #1.25

(vi) CURRENT APPLICATION DATA:

(A) APPLICATION NUMBER:
(B) FILING DATE:

(vii) PRIOR APPLICATION DATA:

(A) APPLICATION NUMBER: US 08/572,645
(B) FILING DATE: 14-DEC-1995

(viii) ATTORNEY/AGENT INFORMATION:

(A) NAME: Louis Myers
(B) REGISTRATION NUMBER: 35,965
(C) REFERENCE/DOCKET NUMBER: MGP-038CP

(ix) TELECOMMUNICATION INFORMATION:

(A) TELEPHONE: (617)227-7400
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(2) INFORMATION FOR SEQ ID NO:1:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 8060 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:1:

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CCTTACTCTG TCAATAACCT CTCAGACTAA TGGTATGCGC ATAGGAGACA GCCTGAACTC 240
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(2) INFORMATION FOR SEQ ID NO:2:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 7333 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:2:

CTACCCCTGC GTGGTGTACG ACTGTGGGCC CCAGCGCGCT TGGAATAAAA ATCCTCTTGC	60
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CAAATAAGGG TTTGGCCGAA CAAGGACCTC CAATCCAAGA ACAGAGGCCA TCTCCTAAC	5580
CCTCTGATTA CAATACAACC TCTGGATCAG TCCCCACTGA GCCTAACATC ACTATTAAA	5640
CAGGGGCGAA ACTTTTTAGC CTCATCCAGG GAGCTTTCA AGCTCTAAC TCCACGACTC	5700
CAGAGGCTAC CTCTTCTTGT TGGCTTGCT TAGCTCGGG CCCACCTTAC TATGAGGGAA	5760
TGGCTAGAGG AGGGAAATTC AATGTGACAA AGGAACATAG AGACCAATGT ACATGGGAT	5820
CCCAAAATAA GCTTACCCCTT ACTGAGGTTT CTGGAAAAGG CACCTGCATA GGGATGGTTC	5880
CCCCATCCCA CCAACACCTT TGTAACCACA CTGAAGCCTT TAATCGAACC TCTGAGAGTC	5940
AATATCTGGT ACCTGGTTAT GACAGGTGGT GGGCATGTAA TACTGGATTA ACCCCTTGTG	6000
TTTCCACCTT GGTTTCAAC CAAACTAAAG ACTTTGCGT TATGGTCAA ATTGTCCCC	6060
GGGTGTACTA CTATCCGAA AAAGCAGTCC TTGATGAATA TGACTATAGA TATAATCGGC	6120
CAAAAAGAGA GCCCATATCC CTGACACTAG CTGTAATGCT CGGATTGGGA GTGGCTGCAG	6180
GCGTGGGAAC AGGAACGGCT GCCCTAATCA CAGGACCGCA ACAGCTGGAG AAAGGACTTA	6240
GTAACCTACA TCGAATTGTA ACGGAAGATC TCCAAGCCCT AGAAAAATCT GTCAGTAACC	6300
TGGAGGAATC CCTAACCTCC TTATCTGAAG TGTTCTACA GAACAGAAGG GGGTTAGATC	6360
TGTTATTTCT AAAAGAAGGA GGGTTATGTG TAGCCTAAA AGAGGAATGC TGCTTCTATG	6420
TAGATCACTC AGGAGCCATC AGAGACTCCA TGAGCAAGCT TAGAGAAAGG TTAGAGAGGC	6480
GTCGAAGGGA AAGAGAGGCT GACCAGGGT GGTTGAAGG ATGGTTCAAC AGGTCTCCTT	6540
GGATGACCAC CCTGCTTCT GCTCTGACGG GGCCCCTAGT AGTCCTGCTC CTGTTACTTA	6600
CAGTTGGGCC TTGCTTAATT AATAGGTTTGT TTGCCTTGT TAGAGAACGA GTGAGTGCAG	6660
TCCAGATCAT GGTACTTAGG CAACAGTACC AAGGCCCTCT GAGCCAAGGA GAAACTGACC	6720
TCTAGCCTTC CCAGTTCTAA GATTAGAACT ATTAACAAGA CAAGAAGTGG GGAATGAAAG	6780
GATGAAAATG CAACCTAACCC CTCCCAGAAC CCAGGAAGTT AATAAAAAGC TCTAAATGCC	6840
CCCGAATTCC AGACCCTGCT GGCTGCCAGT AAATAGGTAG AAGGTACACAC TTCCATTGT	6900
TCCAGGGCCT GCTATCCTGG CCTAAGTAAG ATAACAGGAA ATGAGTTGAC TAATCGCTTA	6960
TCTGGATTCT GTAAAATGCA CTGGCACCAT AGAAGAATTG ATTACACATT GACAGCCCTA	7020
GTGACCTATC TCAACTGCAA TCTGTCACTC TGCCCAGGAG CCCACGCAGA TGCAGACCTC	7080
CGGAGCTATT TTAAAATGAT TGGTCCACGG AGCGCGGGCT CTCGATATT TAAAATGATT	7140

GGTCCATGGA GCGCGGGCTC TCGATATTTT AAAATGATTG GTTTGTGACG CACAGGCTT	7200
GTTGTGAACC CCATAAAAGC TGTCCCGATT CCGCACTCGG GGCCGCAGTC CTCTACCCCT	7260
GCGTGGTGTGTA CGACTGTGGG CCCCAGCGCG CTTGGAATAA AAATCCTCTT GCTGTTGCA	7320
TCAAAAAAAA AAA	7333

(2) INFORMATION FOR SEQ ID NO:3:

- (i) SEQUENCE CHARACTERISTICS:
 - (A) LENGTH: 8132 base pairs
 - (B) TYPE: nucleic acid
 - (C) STRANDEDNESS: single
 - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:3:

GCGTGGTGTGTA CGACTGTGGG CCCCAGCGCG CTTGGAATAA AAATCCTCTT GCTGTTGCA	60
TCAAGACCGC TTCTCGTGAG TGATTAAGGG GAGTCGCCTT TTCCGAGCCT GGAGGTTCTT	120
TTTGCTGGTC TTACATTGGG GGGCTCGTCC GGGATCTGTC GCGGCCACCC CTAACACCCG	180
AGAACCGACT TGGAGGTAAA AAGGATCCTC TTTTAACGT GTATGCATGT ACCGGCCGGC	240
GTCTCTGTTG TGAGTGTCTG TTTTCAGTGG TGCGCGCTTT CGGTTTGCAG CTGTCCTCTC	300
AGGCCGTAAG GGCTGGGGGA CTGTGATCAG CAGACGTGCT AGGAGGATCA CAGGCTGCTG	360
CCCTGGGGGA CGCCCCGGGA GGTGAGGAGA GCCAGGGACG CCTGGTGGTC TCCTACTGTC	420
GGTCAGAGGA CGAATTCTG TTGCTGAAGC GAAAGCTTCC CCCTCCGCGA CCGTCCGACT	480
CTTTTGCTTG CTTGTGGAAG ACGTGGACGG GTCACGTGTG TCTGGATCTG TTGGTTCTG	540
TTTTGTGTGT CTTGTCTTG TGTGTCTTG TCTACAGTTT TAATATGGGA CAGACGGTGA	600
CGACCCCTCT TAGTTGACT CTCGACCATT GGACTGAAGT TAAATCCAGG GCTCATAATT	660
TGTCAGTTCA GGTTAAGAAG GGACCTTGGC AGACTTCTG TGTCTCTGAA TGGCCGACAT	720
TCGATGTTGG ATGGCCATCA GAGGGGACCT TTAATTCTGA GATTATCCTG GCTGTTAAAG	780
CAGTTATTT TCAGACTGGA CCCGGCTCTC ATCCCGATCA GGAGCCCTAT ATCCTTACGT	840
GGCAAGATTG GGCAGAGGAT CCTCCGCCAT GGGTTAAACC ATGGCTGAAT AAGCCAAGAA	900
AGCCAGGTCC CGAATTCTG GCTCTTGGAG AGAAAAACAA ACACCTGGCT GAAAAAGTCA	960
AGCCCTCTCC TCATATCTAC CCCGAGATTG AGGAGCCACC GGCTTGGCCG GAACCCCAAT	1020

CTGTTCCCCC ACCCCCTTAT CTGGCACAGG GTGCCGCGAG GGGACCCTT GCCCCTCCTG 1080
GAGCTCCGGC GGTGGAGGGA CCTGCTGCAG GGACTCGGAG CCGGAGGGC GCCACCCCGG 1140
AGCGGACAGA CGAGATCGCG ACATTACCGC TGCGCACGTA CGGCCCTCCC ACACCGGGGG 1200
GCCAATTGCA GCCCCTCCAG TATTGCCCT TTTCTTCTGC AGATCTCTAT AATTGGAAAA 1260
CTAACCATCC CCCTTCTCG GAGGATCCCC AACGCCTCAC GGGGTTGGTG GAGTCCCTTA 1320
TGTTCTCTCA CCAGCCTACT TGGGATGATT GTCAACAGCT GCTGCAGACA CTCTTCACAA 1380
CCGAGGAGCG AGAGAGAATT CTATTAGAGG CTAGAAAAAA TGTTCCCTGGG GCCGACGGGC 1440
GACCCACGCG GTTGCAAAAT GAGATTGACA TGGGATTTC CTTAACTCGC CCCGGTTGGG 1500
ACTACAACAC GGCTGAAGGT AGGGAGAGCT TGAAAATCTA TCGCCAGGCT CTGGTGGCGG 1560
GTCTCCGGGG CGCCTCAAGA CGGCCCACTA ATTTGGCTAA GTAAAGAGAA GTGATGCAGG 1620
GACCGAATGA ACCCCCCCTCT GTTTTCTTG AGAGGCTCTT GGAAGCCTTC AGGCGGTACA 1680
CCCCTTTGA TCCCACCTCA GAGGCCAAA AAGCCTCAGT GGCTTTGGCC TTTATAGGAC 1740
AGTCAGCCTT GGATATTAGA AAGAAGCTTC AGAGACTGGA AGGGTTACAG GAGGCTGAGT 1800
TACGTGATCT AGTGAAGGAG GCAGAGAAAG TATATTACAA AAGGGAGACA GAAGAAGAAA 1860
GGGAACAAAG AAAAGAGAGA GAAAGAGAGG AAAGGGAGGA AAGACGTAAT AAACGGCAAG 1920
AGAAGAATTG GACTAAGATC TTGGCTGCAG TGGTTGAAGG GAAAAGCAAT ACGGAAAGAG 1980
AGAGAGATT TAGGAAAATT AGGTCAAGGCC CTAGACAGTC AGGGAACCTG GGCAATAGGA 2040
CCCCACTCGA CAAGGACCAA TGTGCATATT GTAAAGAAAAG AGGACACTGG GCAAGGAAC 2100
GCCCAAGAA GGGAAACAAA GGACCAAGGA TCCTAGCTCT AGAAGAAGAT AAAGATTAGG 2160
GGAGACGGGG TTCGGACCCC CTCCCCGAGC CCAGGGTAAC TTTGAAGGTG GAGGGGCAAC 2220
CAGTTGAGTT CCTGGTTGAT ACCGGAGCGA AACATTCACT GCTACTACAG CCATTAGGAA 2280
AACTAAAAGA TAAAAAATCC TGGGTGATGG GTGCCACAGG GCAACAAACAG TATCCATGGA 2340
CTACCCGAAG AACAGTTGAC TTGGGAGTGG GACGGGTAAC CCACTCGTT CTGGTCATAC 2400
CTGAGTGCC AGCACCCCTC TTAGGTAGAG ACTTATTGAC CAAGATGGGA GCACAAATTG 2460
CTTTGAACA AGGGAAACCA GAAAGTGTCTG CAAATAACAA ACCTATCACT GTGTTGACCC 2520
TCCAATTAGA TGACGAATAT CGACTATACT CTCCCCTAGT AAAGCCTGAT CAAAATATAC 2580
AATTCTGGTT GGAACAGTTT CCCCAAGCCT GGGCAGAAAC CGCAGGGATG GGTTTGGCAA 2640
AGCAAGTTCC CCCACAAGTT ATTCAACTGA AGGCCAGTGC CACACCAGTG TCAGTCAGAC 2700
AGTACCCCTT GAGTAAAGAA GCTCAAGAAG GAATTCGGCC GCATGTCCAA AGATTAATCC 2760

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CTAGCCAACC ACTTTTGCC TTCGAATGGA GAGATCCAGG TACGGGAAGA ACCGGGCAGC	3060
TCACCTGGAC CCGACTGCC CAAAGGTTCA AGAACTCCCC GACCATCTT GACGAAGGCC	3120
TACACAGAGA CCTGGCCAAC TTCAGGATCC AACACCCCTCA GGTGACCCCTC CTCCAGTACG	3180
TGGATGACCT GCTTCTGGCG GGAGCCACCA AACAGGACTG CTTAGAAGGC ACGAAGGCAC	3240
TACTGCTGGA ATTGTCTGAC CTAGGCTACA GAGCCTCTGC TAAGAAGGCC CAGATTGCA	3300
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CACGGAAGAA AACTGTAGTC CAGATAACCGG CCCCAACCAC AGCCAAACAA ATGAGAGAGT	3420
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CACTCTACCC GCTAACCAAA GAAAAAGGGG AATTCTCCTG GGCTCCTGAG CACCAGAAGG	3540
CATTTGATGC TATCAAAAG GCCCTGCTGA GCGCACCTGC TCTGGCCCTC CCTGACGTAA	3600
CTAAACCCTT TACCTTTAT GTGGATGAGC GTAAGGGAGT AGCCCGGGGA GTTTAACCC	3660
AAACCCCTAGG ACCATGGAGA AGACCTGTG CCTACCTGTC AAAGAAGCTC GATCCTGTAG	3720
CCAGTGGTTG GCCCATATGC CTGAAGGCTA TCGCAGCTGT GGCCATACTG GTCAAGGACG	3780
CTGACAAATT GACTTGGGA CAGAATATAA CTGTAATAGC CCCCCATGCA TTGGAGAACAA	3840
TCGTTGGCA GCCCCCAGAC CGATGGATGA CCAACGCCCG CATGACCCAC TATCAAAGCC	3900
TGCTTCTCAC AGAGAGGGTC ACGTTCGCTC CACCAGCCGC TCTCAACCCT GCCACTCTTC	3960
TGCCTGAAGA GACTGATGAA CCAGTGACTC ATGATTGCCA TCAACTATTG ATTGAGGAGA	4020
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CTGACGGAAG CAGCTATGTG GTGGAAGGTA AGAGGATGGC TGGGGCGGCG GTGGTGGACG	4140
GGACCCGCAC GATCTGGCC AGCAGCCTGC CGGAAGGAAC TTCAGCACAA AAGGCTGAGC	4200
TCATGGCCCT CACGCAAGCT TTGCGGCTGG CCGAAGGGAA ATCCATAAAC ATTTATACGG	4260
ACAGCAGGTA TGCCTTGCG ACTGCACACG TACATGGGGC CATCTATAAA CAAAGGGGT	4320
TGCTTACCTC AGCAGGGAGG GAAATAAAGA ACAAAAGAGGA AATTCTAAGC CTATTAGAAG	4380
CCGTACATTT ACCAAAAAGG CTAGCTATTA TACACTGTCC TGGACATCAG AAAGCTAAAG	4440
ATCTCATATC CAGAGGAAAC CAGATGGCTG ACCGGGTTGC CAAGCAGGCA GCCCAGGGTG	4500

TTAACCTTCT GCCTATAATA GAAATGCCCA AAGCCCCAGA ACCCAGACGA CAGTACACCC	4560
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GCTATACCTC AGATGGGAAG GAAATCCTGC CCCACAAAGA AGGGTTAGAA TATGTCCAAC	4680
AGATAACATCG TCTAACCCAC CTAGGAACTA AACACCTGCA GCAGTTGGTC AGAACATCCC	4740
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AGGCACTTGA GTGGGTGAGA CAACGAGCGT GGAGGCAACT CCGGGAGGCC TACTCAGGAG	5460
GAGGAGACTT GCAGATCCCA CATCGTTCC AAGTGGGAGA TTCAGTCTAC GTTAGACGCC	5520
ACCGTGCAGG AAACCTCGAG ACTCGGTGGA AGGGCCCTTA TCTCGTACTT TTGACCACAC	5580
CAACGGCTGT GAAAGTCGAA GGAATCTCCA CCTGGATCCA TGCATCCCAC GTTAAACCGG	5640
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GGTATGTCTT GGGGAATGGT ATATTATGGA GGCTCGGGTA AACAAACCAGG CTCCATTCTA 6300
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CACACTGAAG CCTTTAATCA AACCTCTGAG AGTCAATATC TGGTACCTGG TTATGACAGG 6780
TGGTGGCAT GTAATACTGG ATTAACCCCT TGTGTTCCA CCTTGGTTTT TAACCAAAC 6840
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TGTGTAGCCT TGAAGGAGGA ATGCTGTTTT TATGTGGATC ATTCAAGGGC CATCAGAGAC 7260
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GGGTGGTTTG AGGGATGGTT CAACAGGTCT CTTTGGTTGG CTACCCCTACT TTCTGCTTTA 7380
ACAGGACCCCT TAATAGTCCT CCTCCTGTTA CTCACAGTTG GGCCATGTAT TATTAACAAG 7440
TTAATTGCCT TCATTAGAGA ACCAATAAGT GCAGTCCAGA TCATGGTACT TAGACAACAG 7500
TACCAAAGCC CGTCTAGCAG GGAAGCTGGC CGCTAGCTCT ACCAGTTCTA AGATTAGAAC 7560
TATTAACAAG AGAAGAAGTG GGGAAATGAAA GGATGAAAAT ACAACCTAAC CTAATGAGAA 7620
GCTTAAAATT GTTCTGAATT CCAGAGTTG TTCCTTATAG GTAAAAGATT AGGTTTTTG 7680
CTGTTTAAA ATATGCGGAA GTAAAATAGG CCCTGAGTAC ATGTCTCTAG GCATGAAACT 7740
TCTTGAAACT ATTTGAGATA ACAAGAAAAG GGAGTTCTA ACTGCTTGGT TAGCTTCTGT 7800
AAAACGGTT GCGCCATAAA GATGTTGAAA TGTTGATACA CATATCTTGG TGACAACATG 7860
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GGTTTGTAAA GCGCGGGCTT TGTTGTGAAC CCCATAAAAG CTGTCCCGAC TCCACACTCG 8040
GGGCCGCAGT CCTCTACCCC TGC GTGGTGT ACGACTGTGG GCCCCAGCGC GCTTGGAAATA 8100
AAAATCCTCT TGCTGTTGC ATCAAAAAAA AA 8132

(2) INFORMATION FOR SEQ ID NO:4:

(i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 19 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:4:

TGCCTAGAGA CATGTACTC 19

(2) INFORMATION FOR SEQ ID NO:5:

(i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 21 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:5:

CCTCTTCTAG CCATTCCTTC A 21

(2) INFORMATION FOR SEQ ID NO:6:

(i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 22 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:6:

TCGAGACTCG GTGGAAGGGC CC 22

(2) INFORMATION FOR SEQ ID NO:7:

(i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 22 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:7:

GGGCCCTTCC ACCGAGTCTC GA

22

(2) INFORMATION FOR SEQ ID NO:8:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 22 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:8:

ACCTGGATCC ATGCATCCCA CG

22

(2) INFORMATION FOR SEQ ID NO:9:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 22 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:9:

CGTGGGATGC ATGGATCCAG GT

22

(2) INFORMATION FOR SEQ ID NO:10:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 20 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:10:

GGCGCCACCT CCCGATTCTGG

20

(2) INFORMATION FOR SEQ ID NO:11:

(i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 20 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:11:

CCGAATCGGG AGGTGGCGCC

20

(2) INFORMATION FOR SEQ ID NO:12:

(i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 20 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:12:

TCCCCCTTAAG CTTCGCCTCC

20

(2) INFORMATION FOR SEQ ID NO:13:

(i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 20 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:13:

GGAGGGCGAAG CTTAAGGGGA

20

(2) INFORMATION FOR SEQ ID NO:14:

(i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 23 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:14:

AAAAGCACAA AGGGCAGGAG AGC

23

(2) INFORMATION FOR SEQ ID NO:15:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 23 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:15:

GCTCTCCTGC CCTTTGTGCT TTT

23

(2) INFORMATION FOR SEQ ID NO:16:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 20 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:16:

CCTTTAGGAA CCTGGTGGCC

20

(2) INFORMATION FOR SEQ ID NO:17:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 20 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:17:

GGCCACCAGG TTCCTAAAGG

20

(2) INFORMATION FOR SEQ ID NO:18:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 20 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single

(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:18:

CCCCCAGATA TCCTCCATGC

20

(2) INFORMATION FOR SEQ ID NO:19:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 20 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:19:

GCATGGAGGA TATCTGGGGG

20

(2) INFORMATION FOR SEQ ID NO:20:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 22 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:20:

GCAGTTCCA ATCAATCCCC AA

22

(2) INFORMATION FOR SEQ ID NO:21:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 22 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:21:

TTGGGGATTG ATTGGAACT GC

22

(2) INFORMATION FOR SEQ ID NO:22:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 23 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:22:

TTTATGTTTG CCCAGGACCA CCA

23

(2) INFORMATION FOR SEQ ID NO:23:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 23 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:23:

TGGTGGTCCT GGGCAACAT AAA

23

(2) INFORMATION FOR SEQ ID NO:24:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 23 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:24:

GGGAGGTGGC GCCGGCTTAA CGT

23

(2) INFORMATION FOR SEQ ID NO:25:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 23 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:25:

ACGTTAAGCC GGCGCCACCT CCC

23

(2) INFORMATION FOR SEQ ID NO:26:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 24 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:26:

CCCCCAACCC AAGGACCAGG ACCA

24

(2) INFORMATION FOR SEQ ID NO:27:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 24 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:27:

TGGTCCTGGT CCTTGGGTTG GGGG

24

(2) INFORMATION FOR SEQ ID NO:28:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 22 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:28:

GCAGCACGAC TAAAATGGGG GC

22

(2) INFORMATION FOR SEQ ID NO:29:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 22 base pairs

- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:29:

CCCCCCATTT TAGTCGTGCT GC

22

(2) INFORMATION FOR SEQ ID NO:30:

- (i) SEQUENCE CHARACTERISTICS:
- (A) LENGTH: 20 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:30:

CCCCCATCCC ACCAACACCT

20

(2) INFORMATION FOR SEQ ID NO:31:

- (i) SEQUENCE CHARACTERISTICS:
- (A) LENGTH: 20 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:31:

AGGTGTTGGT GGGATGGGGG

20

(2) INFORMATION FOR SEQ ID NO:32:

- (i) SEQUENCE CHARACTERISTICS:
- (A) LENGTH: 20 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:32:

TCTCCCCAC CCCGAAACAT

20

(2) INFORMATION FOR SEQ ID NO:33:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 20 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:33:

ATGTTTCGGG GTGGGGGAGA

20

(2) INFORMATION FOR SEQ ID NO:34:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 24 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:34:

AGCCAAGAAA GCCAGGTCCC CGAA

24

(2) INFORMATION FOR SEQ ID NO:35:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 24 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:35:

TTCGGGGACC TGGCTTTCTT GGCT

24

(2) INFORMATION FOR SEQ ID NO:36:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 21 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:36:

AGGCTCTGGT GGCGGGTCTC C

21

(2) INFORMATION FOR SEQ ID NO:37:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 21 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:37:

GGAGACCCGC CACCAAGAGCC T

21

(2) INFORMATION FOR SEQ ID NO:38:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 20 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:38:

CCGCAGGGAT GGGTTTGGCA

20

(2) INFORMATION FOR SEQ ID NO:39:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 20 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:39:

TGCCAAACCC ATCCCTGCGG

20

(2) INFORMATION FOR SEQ ID NO:40:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 22 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:40:

GCTCACCTGG ACCCGACTGC CC

22

(2) INFORMATION FOR SEQ ID NO:41:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 22 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:41:

GGGCAGTCGG GTCCAGGTGA GC

22

(2) INFORMATION FOR SEQ ID NO:42:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 24 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:42:

GTTTACGGGA CGGGCAGCGA TGGC

24

(2) INFORMATION FOR SEQ ID NO:43:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 24 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:43:

GCCATCGCTG CCCGTCCCGT AAAC

24

(2) INFORMATION FOR SEQ ID NO:44:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 26 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:44:

TGGCTGGGGC GGCGGTGGTG GACGGG

26

(2) INFORMATION FOR SEQ ID NO:45:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 26 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:45:

CCCGTCCACC ACCGCCGCC CAGCCA

26

(2) INFORMATION FOR SEQ ID NO:46:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 24 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:46:

GCCCAAAGCC CCAGAACCCA GACG

24

(2) INFORMATION FOR SEQ ID NO:47:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 24 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single

(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:47:

CGTCTGGGTT CTGGGGCTTT GGGC

24

(2) INFORMATION FOR SEQ ID NO:48:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 20 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:48:

GATGAAACAGG CAGACATCTG

20

(2) INFORMATION FOR SEQ ID NO:49:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 20 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:49:

CGCTTACAGA CAAGCTGTGA

20

(2) INFORMATION FOR SEQ ID NO:50:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 19 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:50:

AGAACAAAGG CTGGGAAGC

19

(2) INFORMATION FOR SEQ ID NO:51:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 20 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:51:

ATAGGAGACA GCCTGAACTC

20

(2) INFORMATION FOR SEQ ID NO:52:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 20 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:52:

GGACCATTGT CTGACCCTAT

20

(2) INFORMATION FOR SEQ ID NO:53:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 20 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:53:

GTCAACACCT ATACCAGCTC

20

(2) INFORMATION FOR SEQ ID NO:54:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 20 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:54:

CATCTGAGGT ATAGCAGGTC

20

(2) INFORMATION FOR SEQ ID NO:55:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 20 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:55:

GCAGGGTAG GAACAGGAAC

20

(2) INFORMATION FOR SEQ ID NO:56:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 20 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:56:

ACCTGTTGAA CCATCCCTCA

20

(2) INFORMATION FOR SEQ ID NO:57:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 20 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:57:

CGAATGGAGA GATCCAGGTA

20

(2) INFORMATION FOR SEQ ID NO:58:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 20 base pairs

- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:58:

CCTGCATCAC TTCTCTTACC

20

(2) INFORMATION FOR SEQ ID NO:59:

- (i) SEQUENCE CHARACTERISTICS:
- (A) LENGTH: 20 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:59:

TTGCCTGCTT GTGGAATACG

20

(2) INFORMATION FOR SEQ ID NO:60:

- (i) SEQUENCE CHARACTERISTICS:
- (A) LENGTH: 21 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:60:

CAAGAGAAGA AGTGGGGAAT G

21

(2) INFORMATION FOR SEQ ID NO:61:

- (i) SEQUENCE CHARACTERISTICS:
- (A) LENGTH: 20 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:61:

CACAGTCGTA CACCACCGCAG

20

(2) INFORMATION FOR SEQ ID NO:62:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 20 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:62:

GGGAGACAGA AGAAGAAAGG

20

(2) INFORMATION FOR SEQ ID NO:63:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 20 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:63:

CGATAGTCAT TAGTCCCAGG

20

(2) INFORMATION FOR SEQ ID NO:64:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 21 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:64:

TGCTGGTTTG CATCAAGACC G

21

(2) INFORMATION FOR SEQ ID NO:65:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 20 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:65:

GTGCGCAAAGG CATAACCTGCT

20

(2) INFORMATION FOR SEQ ID NO:66:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 20 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:66:

ACAGAGCCTC TGCTAAGAAG

20

(2) INFORMATION FOR SEQ ID NO:67:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 19 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:67:

GCAGGCTGTTG ACAATCAGTC

19

(2) INFORMATION FOR SEQ ID NO:68:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 20 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:68:

TATGAGGAGA GGGCTTGACT

20

(2) INFORMATION FOR SEQ ID NO:69:

(i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 19 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:69:

AGCAGACGTG CTAGGAGGT

19

(2) INFORMATION FOR SEQ ID NO:70:

(i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 19 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:70:

TCCTCTTGCT GTTTGCATC

19

(2) INFORMATION FOR SEQ ID NO:71:

(i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 20 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:71:

CAGACACTCA GAACAGAGAC

20

(2) INFORMATION FOR SEQ ID NO:72:

(i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 20 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:72:

ACATCGTCTA ACCCACCTAG

20

(2) INFORMATION FOR SEQ ID NO:73:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 21 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:73:

CTCGTTTCTG GTCATACCTG A

21

(2) INFORMATION FOR SEQ ID NO:74:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 19 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:74:

GAGTACATCT CTCTAGGCA

19